

## SEQUENCE LISTING

<110> Consiglio Nazionale delle Ricerche  
Domenico GERACI  
Angela BONURA  
Paolo COLOMBO

<120> Fusion proteins comprising modified allergens of the NS-LTPS family, use thereof and pharmaceutical compositions comprising the same

<130> 4161-18 / BW352R

<140> US  
<141> 2006-08-28

<150> PCT/IB2005/050714  
<151> 2005-02-28

<150> IT RM2004A000103  
<151> 2004-02-27

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1 5 10 15

ttc gtg aag ggg gag gag aag gag ccg tcg aag gag nnn nnn agc ggc 96
Phe Val Lys Gly Glu Glu Lys Glu Pro Ser Lys Glu Xaa Xaa Ser Gly
20 25 30

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acg aag aag ctg agc gag gag gtg aag acg acg gag cag aag agg gag	35	40	45	144
Thr Lys Lys Leu Ser Glu Glu Val Lys Thr Thr Glu Gln Lys Arg Glu				
gcc nnn aag nnn ata gtg cgc gcc acg aag ggc atc tcc ggt atc aaa	50	55	60	192
Ala Xaa Lys Xaa Ile Val Arg Ala Thr Lys Gly Ile Ser Gly Ile Lys				
aat gaa ctt gtc gcc gag gtc ccc aag aag nnn gat att aag acc act	65	70	75	240
Asn Glu Leu Val Ala Glu Val Pro Lys Lys Xaa Asp Ile Lys Thr Thr				
ctc ccg ccc atc acc gcc gac ttc gac tgc nnn aag atc caa agt act	85	90	95	288
Leu Pro Pro Ile Thr Ala Asp Phe Asp Cys Xaa Lys Ile Gln Ser Thr				
att ttc aga ggt tac tat gga ttc caa gaa acc nnn ggg act atg gtg	100	105	110	336
Ile Phe Arg Gly Tyr Tyr Gly Phe Gln Glu Thr Xaa Gly Thr Met Val				
aga gcg ctg atg ccg nnn ctg ccg ttc gtg cag ggg aaa gag aaa gag	115	120	125	384
Arg Ala Leu Met Pro Xaa Leu Pro Phe Val Gln Gly Lys Glu Lys Glu				
ccg tca aag ggg nnn nnn agc ggc gcc aaa aga ttg gac ggg gag acg	130	135	140	432
Pro Ser Lys Gly Xaa Xaa Ser Gly Ala Lys Arg Leu Asp Gly Glu Thr				
aag acg ggg ccg cag agg gtg cac gct nnn gag nnn atc cag acc gcc	145	150	155	480
Lys Thr Gly Pro Gln Arg Val His Ala Xaa Glu Xaa Ile Gln Thr Ala				
atg aag act tat tcc gac atc gac ggg aaa ctc gtc agc gag gtc ccc	165	170	175	528
Met Lys Thr Tyr Ser Asp Ile Asp Gly Lys Leu Val Ser Glu Val Pro				
aag cac nnn ggc atc gtt gac agc aag ctc ccg ccc att gac gtc aac	180	185	190	576
Lys His Xaa Gly Ile Val Asp Ser Lys Leu Pro Pro Ile Asp Val Asn				
atg gac nnn aag aca gtt gga gtg gtt cct cgg caa ccc caa ctt cca	195	200	205	624
Met Asp Xaa Lys Thr Val Gly Val Val Pro Arg Gln Pro Gln Leu Pro				
gtc tct ctc cgt cat ggt ccc gtc acg ggc cca agt gat ccc gcc cac	210	215	220	672
Val Ser Leu Arg His Gly Pro Val Thr Gly Pro Ser Asp Pro Ala His				
aaa gca cgg ttg gag aga ccc cag att aga gtt ccg ccc ccc gca cgg	225	230	235	720
Lys Ala Arg Leu Glu Arg Pro Gln Ile Arg Val Pro Pro Pro Ala Pro				
gaa aaa gcc taa				732
Glu Lys Ala				

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<213> Parietaria judaica

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<223> Xaa at location 29 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,
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<223> Xaa at location 30 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,
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<223> Xaa at location 50 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,
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<223> Xaa at location 52 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,
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<222> (91)..(91)
<223> Xaa at location 91 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,
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<223> Xaa at location 133 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,
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<223> Xaa at location 156 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,
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Phe Val Lys Gly Glu Glu Lys Glu Pro Ser Lys Glu Xaa Xaa Ser Gly  
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Thr Lys Lys Leu Ser Glu Glu Val Lys Thr Thr Glu Gln Lys Arg Glu  
 35 40 45

Ala Xaa Lys Xaa Ile Val Arg Ala Thr Lys Gly Ile Ser Gly Ile Lys  
 50 55 60

Asn Glu Leu Val Ala Glu Val Pro Lys Lys Xaa Asp Ile Lys Thr Thr  
 65 70 75 80

Leu Pro Pro Ile Thr Ala Asp Phe Asp Cys Xaa Lys Ile Gln Ser Thr  
 85 90 95

Ile Phe Arg Gly Tyr Gly Phe Gln Glu Thr Xaa Gly Thr Met Val  
 100 105 110

Arg Ala Leu Met Pro Xaa Leu Pro Phe Val Gln Gly Lys Glu Lys Glu  
 115 120 125

Pro Ser Lys Gly Xaa Xaa Ser Gly Ala Lys Arg Leu Asp Gly Glu Thr  
 130 135 140

Lys Thr Gly Pro Gln Arg Val His Ala Xaa Glu Xaa Ile Gln Thr Ala  
 145 150 155 160

Met Lys Thr Tyr Ser Asp Ile Asp Gly Lys Leu Val Ser Glu Val Pro  
 165 170 175

Lys His Xaa Gly Ile Val Asp Ser Lys Leu Pro Pro Ile Asp Val Asn  
 180 185 190

Met Asp Xaa Lys Thr Val Gly Val Val Pro Arg Gln Pro Gln Leu Pro  
 195 200 205

Val Ser Leu Arg His Gly Pro Val Thr Gly Pro Ser Asp Pro Ala His  
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Lys Ala Arg Leu Glu Arg Pro Gln Ile Arg Val Pro Pro Pro Ala Pro  
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Glu Lys Ala

<210> 3  
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 <221> CDS  
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48

ttc gtg aag ggg gag gag aag gag ccg tcg aag gag agc agc agc ggc  
 Phe Val Lys Gly Glu Glu Lys Glu Pro Ser Lys Glu Ser Ser Ser Gly  
 20 25 30

96

' acg aag aag ctg agc gag gag gtg aag acg acg gag cag aag agg gag	35	40	45	144
Thr Lys Lys Leu Ser Glu Glu Val Lys Thr Thr Glu Gln Lys Arg Glu				
gcc tgc aag tgc ata gtg cgc gcc acg aag ggc atc tcc ggt atc aaa	50	55	60	192
Ala Cys Lys Cys Ile Val Arg Ala Thr Lys Gly Ile Ser Gly Ile Lys				
aat gaa ctt gtc gcc gag gtc ccc aag aag tgc gat att aag acc act	65	70	75	240
Asn Glu Leu Val Ala Glu Val Pro Lys Lys Cys Asp Ile Lys Thr Thr				
ctc ccg ccc atc acc gcc gac ttc gac tgc tcc aag atc caa agt act	85	90	95	288
Leu Pro Pro Ile Thr Ala Asp Phe Asp Cys Ser Lys Ile Gln Ser Thr				
att ttc aga ggt tac tat gga ttc caa gaa acc agc ggg act atg gtg	100	105	110	336
Ile Phe Arg Gly Tyr Tyr Gly Phe Gln Glu Thr Ser Gly Thr Met Val				
aga gcg ctg atg ccg tgc ctg ccg ttc gtg cag ggg aaa gag aaa gag	115	120	125	384
Arg Ala Leu Met Pro Cys Leu Pro Phe Val Gln Gly Lys Glu Lys Glu				
ccg tca aag ggg agc agc ggc gcc aaa aga ttg gac ggg gag acg	130	135	140	432
Pro Ser Lys Gly Ser Ser Gly Ala Lys Arg Leu Asp Gly Glu Thr				
aag acg ggg ccg cag agg gtg cac gct tgt gag tgc atc cag acc gcc	145	150	155	480
Lys Thr Gly Pro Gln Arg Val His Ala Cys Glu Cys Ile Gln Thr Ala				
atg aag act tat tcc gac atc gac ggg aaa ctc gtc agc gag gtc ccc	165	170	175	528
Met Lys Thr Tyr Ser Asp Ile Asp Gly Lys Leu Val Ser Glu Val Pro				
aag cac tgc ggc atc gtt gac agc aag ctc ccg ccc att gac gtc aac	180	185	190	576
Lys His Cys Gly Ile Val Asp Ser Lys Leu Pro Pro Ile Asp Val Asn				
atg gac tgc aag aca gtt gga gtg gtt cct cgg caa ccc caa ctt cca	195	200	205	624
Met Asp Cys Lys Thr Val Gly Val Val Pro Arg Gln Pro Gln Leu Pro				
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Val Ser Leu Arg His Gly Pro Val Thr Gly Pro Ser Asp Pro Ala His				
aaa gca cgg ttg gag aga ccc cag att aga gtt ccg ccc ccc gca ccg	225	230	235	720
Lys Ala Arg Leu Glu Arg Pro Gln Ile Arg Val Pro Pro Pro Ala Pro				
gaa aaa gcc taa				732
Glu Lys Ala				

<211> 243  
<212> PRT  
<213> Parietaria judaica

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Glu Glu Ala Ser Gly Lys Val Val Gln Asp Ile Met Pro Cys Leu His  
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Phe Val Lys Gly Glu Glu Lys Glu Pro Ser Lys Glu Ser Ser Ser Gly  
20 25 30

Thr Lys Lys Leu Ser Glu Glu Val Lys Thr Thr Glu Gln Lys Arg Glu  
35 40 45

Ala Cys Lys Cys Ile Val Arg Ala Thr Lys Gly Ile Ser Gly Ile Lys  
50 55 60

Asn Glu Leu Val Ala Glu Val Pro Lys Lys Cys Asp Ile Lys Thr Thr  
65 70 75 80

Leu Pro Pro Ile Thr Ala Asp Phe Asp Cys Ser Lys Ile Gln Ser Thr  
85 90 95

Ile Phe Arg Gly Tyr Tyr Gly Phe Gln Glu Thr Ser Gly Thr Met Val  
100 105 110

Arg Ala Leu Met Pro Cys Leu Pro Phe Val Gln Gly Lys Glu Lys Glu  
115 120 125

Pro Ser Lys Gly Ser Ser Gly Ala Lys Arg Leu Asp Gly Glu Thr  
130 135 140

Lys Thr Gly Pro Gln Arg Val His Ala Cys Glu Cys Ile Gln Thr Ala  
145 150 155 160

Met Lys Thr Tyr Ser Asp Ile Asp Gly Lys Leu Val Ser Glu Val Pro  
165 170 175

Lys His Cys Gly Ile Val Asp Ser Lys Leu Pro Pro Ile Asp Val Asn  
180 185 190

Met Asp Cys Lys Thr Val Gly Val Val Pro Arg Gln Pro Gln Leu Pro  
195 200 205

Val Ser Leu Arg His Gly Pro Val Thr Gly Pro Ser Asp Pro Ala His  
210 215 220

Lys Ala Arg Leu Glu Arg Pro Gln Ile Arg Val Pro Pro Pro Ala Pro  
225 230 235 240

Glu Lys Ala

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<213> Artificial Sequence

<220>
<223> forward primer for insertion of mutation in position 29 and 30

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<212> DNA
<213> Artificial Sequence
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<223> reverse Parj2 primer

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